

## ABSTRACT OF THE DISCLOSURE

A decoder for improving efficiency of demodulation of address information, which is recorded by performing phase-  
5 modulation on the wobble of a groove. The decoder demodulates the address information based on the phase inversion pattern of an ADIP, which is detected using a first clock signal generated by a digital PLL circuit, until an analog PLL circuit is locked. The decoder demodulates the  
10 address information based on the phase inversion pattern of the detected ADIP using a second clock signal, which is generated by the analog PLL circuit, after the analog PLL circuit is locked.